

**FORECASTS FOR RAISIN MAKERS.**

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There are now many specialized industries, agricultural and commercial, that are vitally concerned with the various warnings issued by the Weather Bureau, and among these is the raisin making industry. It is distinctively a California industry and is still further restricted geographically as it is confined largely to the interior valleys of that State. Raisins are grown in all counties of the San Joaquin Valley, but Fresno County with the city of Fresno near the center of the raisin producing district, produces the greatest tonnage of this fruit, the total production for the State having reached the considerable figure of approximately 100,000,000 pounds. However, no more than two-fifths of all the grapes grown in the State are made into raisins, the remainder being used in making wines or for shipment as fresh table fruit.

In its relation to the Weather Bureau, this industry possesses some features that distinguish it from all of the others that have come to rely on the regular and special forecasts of this service so that timely provision may be made to prevent damage from unfavorable weather conditions. While there are conditions of weather that may unfavorably affect the grapes during the growing stages that are not of the kind against which protective measures can be taken and any consequent loss is probably not a preventable one. For example, a period of unusual heat when the grapes are just "setting" is often the cause of much dropping so that the clusters are not well filled and this injury is sometimes increased when high winds accompany the high temperature.

It is during the curing or drying season, then, that valuable service is rendered the grower by the Bureau in giving him warning of coming rain so that his raisins may be properly protected. The work of picking the grapes is begun about August 20 and is usually completed during the first week of September, if the crop has ripened with general evenness and ample labor for the business of picking has been available. As the grapes are picked they are spread on small trays, 2 by 3 feet in size. The bottoms of these trays are made of material one-quarter of an inch in thickness and the pieces forming the bottom are held together by nailing battens across each end. For the average yield, about 300 trays per acre are needed. The picking is done at a stipulated price per tray, 22 pounds of grapes being placed on each one. As the trays are filled they are set on the ground, side by side, between the rows of vines. Alternate rows afford sufficient room for the average crop when the trays are laid close together, and the trays are then in position for the most expeditious handling when stacking may be necessary.

Under normal drying conditions in the early part of the curing season about three weeks is required for proper curing. Later in the season with lower temperatures, increased relative humidity, and occasional rains the season may be greatly prolonged and it is usual that from one cause or another a considerable proportion of the crop must be carried through the perils of a rather late curing season. Many of those who are engaged in the production of raisin grapes are engaged in that alone to the exclusion of every other horticultural or agricultural interest and the fruit of a whole year's labor is spread upon the ground at one time during the drying season. Naturally, the keenest anxiety prevails among the growers at this time lest a rain should come and damage or, it may be, completely ruin the crop. If the raisins become wet a damage ranging from 10 or 20 per cent to total loss occurs. The damage is greater when the wetting occurs in the more advanced stages of the curing and it is also greater, of course, the more prolonged is the period of rainfall.

Even those raisins that have been protected from the rain are not altogether immune from damage, if wet, cloudy weather continues for four or five days, in which case the partly cured fruit may mold in the stack.

How favorable to this business of raisin making the weather is under normal conditions may readily be seen when it is pointed out that August at Fresno has 96 per cent of sunshine and September 89 per cent and that normally no rain occurs until about September 20. But occasional rains do occur and the forecaster is called upon for the utmost vigilance so that they do not come unheralded. Following a summer in which cloudless day has succeeded cloudless day, the appearance of even a few clouds is occasion enough for general alarm among the growers and those who have not already received the forecast hasten to the telephone to get it. For be it known that each grower is himself an alert observer and no change in local appearances goes unheeded. Owing to a particularly unfavorable schedule for the dispatch of mails from the local post-office the dissemination of forecasts by mail is not so complete as might be wished and the telephone is the most effective means at present in use here for the distribution of regular forecasts and special warnings. However, with increasing cloudiness and increasing anxiety on the part of the growers this means proves inadequate when limited to one office telephone and in order to get warnings to those on our special telephone list it has been necessary to call them from the residence telephone while the office telephone is being answered as rapidly as the switching can be done.

The grower having received the warning, all available help is hurried into the vineyard and the work of stacking the trays is rushed with all possible speed. How every hand, including even school children and those whose usual occupations do not take them near the vineyards, is pressed into service in these emergencies has been mentioned by Professor McAdie and others, as also, that as much as 75 cents per hour is demanded and received for this work. It must be remembered that the number of trays spread upon the ground in the midst of the drying season is very great indeed, the vineyard ranging in size from a few acres to four and five thousand acres, at most of which temporary assistance is required when stacking the raisins and which bid for the help to be had. These virtual calls to arms have been made in the streets of Fresno during the present season.

About 20 trays are placed in one stack and an empty tray is laid on top to turn off the water while other empty trays are hung at each side of the stack to prevent the rain from being blown in. That no very great wind velocities accompany these early rains is a fortunate meteorological circumstance else these none too stable stacks of trays would be blown over. There being very little danger on this account, the stacking may proceed without loss of time in choosing a site for the stack or in providing any other protection than that afforded by the trays themselves.

Precautionary measures against damage by stress of weather always involve necessary expense, whether they are taken to avoid damage by frost, flood, storm, or rain and the expenses of stacking raisins and spreading them again when the danger from rain is past adds a considerable item to the cost of their production. Owing to the fact that damage more or less severe positively results if the raisins become wet the growers are not inclined to take any chances, whatever, and unguided by the forecasts much more stacking would be done. Thus the Bureau has saved much to the growers by its timely warnings of rain and it has also effected a great saving for them in avoiding needless stacking.